

Theories of evolution
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PROF. HUXLEY'S REPLY TO MR. DARWIN'S CRITICS.

More Criticisms on Darwin: and Administrative Nihilism, by T. H. HUXLEY, LL. D., F. R. S., author of "Lay Sermons," "Man's Place in Nature," &c. New York : D. Appleton & Co.

1. *Contributions to the Theory of Natural Selection*, by A. R. WALLACE: 1870.
2. *The Genesis of Species*, by ST. GEORGE MIVART, F. R. S. (Second Edition:) 1871.
3. *Darwin's Descent of Man, Quarterly Review*, July, 1871.

In some former articles in this JOURNAL, we sought to bring together in as condensed a form as our limited space required, the various arguments and considerations that seemed to us to constitute a valid array of objection to Mr. Darwin's Theory of Evolution by Natural and Sexual Selection, especially as relied upon to determine the question of the origin of man. Those arguments are derived from the three departments of science commonly understood as zoölogical, psychological, and ethical: though all these would now be comprehended by the Materialists under the single head of "Biology." Although each of the points treated of in the preceding articles, or referred to as treated by others, might be expanded into a volume, and the full force of the argument, especially in the psychological and ethical divisions of the subject may, through a compulsory brevity, have been inadequately represented, we do not propose to supplement it here, by any formal statement or discussion. Our present object



is simply to remark upon the recent paper of Prof. Huxley in the *Contemporary Review*, the title of which is given in the republication named at the head of this article: and to express our gratification at finding how little even the ablest writer among the advocates of Mr. Darwin's theory has to show by way of real answer to the arguments of Messrs. Wallace and Mivart.

As in the case of the British Geologists against Sir Wm. Thompson, (*Lay Sermons*, p. 229,) Prof. Huxley appears to have constituted himself the "Attorney-General" for the Darwinian Evolutionists: and it may well be doubted, whether, in point of literary finish as well as scientific acuteness, any more competent person could have been selected for the special task which he has assigned himself. But the style of a partisan advocate is readily distinguishable from that of a judicial investigation of truth: and it seems something incongruous with the patient calmness of scientific discussion that we should be so often encountering arguments *ad invidiam*, and such subtle mixture of the covert sneer and irreverence as the following:

Mr. Wallace thinks it necessary to call in an intelligent Agent—a sort of supernatural Sir John Sebright (!)—to produce even the animal frame of man: while Mr. Mivart requires no Divine assistance till he comes to man's soul." (p. 7.)

This may be deemed clever: but it is the cleverness of a jury lawyer, not of the scientific lecture-room. It is a scoff which reminds one of Cicero's remark upon Velleius, that "he had made up his mind to be an Epicurean before he had learned the doctrine." It is proved indeed that a man may be eminent in science without necessarily being a Christian: but the levity which shocks the general Christian sentiment by a fliprant comparison of the Creator to a mere pigeon-fancier or horse-breeder, is at least in very questionable taste.

Writers like Prof. Huxley may be as anxious as Lucretius to strike all intelligence out of the operations of nature, but they have not reached yet that point of moral hardihood to glory in, and not repudiate rather, the name of atheist.

Prof. Huxley sets out with the statement that Mr. Darwin's "Origin of Species" has, "in a dozen years, worked as complete a revolution in biological science as the *Principia* did in Astronomy," and applies to it an expression of Hemholtz, "an essentially new creative thought." He speaks of a "mixture of ignorance and insolence," and "abusive nonsense," with which Mr. Darwin was at first assailed, and contrasts the style of the article in the *Quarterly Review* for July, 1871, with that of another in the same *Review* which preceded it by just eleven years. We have read both those articles, and we are free to say that we can discover nothing in either of them to justify the application of such strong epithets. We found no "mixture of ignorance and insolence" and no "abusive nonsense:" and as for contrast, there is none but such as should arise from the legitimate advance in the state of science, and the increase in the number of ascertained facts in ten years' time. In point of fact the article of 1860 is the more complimentary to Mr. Darwin of the two, giving him the highest credit for his real contributions to natural history, as well as for genius and originality in the exposition of his new theory. And the arguments of that article against that theory, as an adequate account of the origin of species, are for the most part as valid as ever, and have not yet been refuted. Indeed, we can not discover so much "contrast" between the earlier and later papers referred to, as there is between the first and last editions of Mr. Darwin's own work. And Mr. Darwin himself has had the candor

to admit that the reasoning of his various critics has compelled him in many instances to modify his own conclusions, though, as we think we have elsewhere sufficiently shown, very little for the better. If the later "criticisms on Darwin," as Prof. Huxley says, show more "attention to those philosophical questions which underlie all physical science," Mr. Darwin himself, in his later editions, is less explicit in his demands upon our faith in that mythological feat by which a "swimming bear" was supposed capable of being "developed into something as monstrous as a whale."

As to Mr. Darwin's theory being "a new creative thought" (though its main element would rather seem to be antagonistic to all ideas of *creation* whatever) we have no wish to detract from the credit of original discovery or invention which may be due either to him or to Mr. Wallace. But if the originality consist in the maintenance of evolution by the specific theory of *natural selection*, we can not but agree with a writer in the *Edinburgh* for 1860, that it is only "the *homeopathic form*" of the transmutation hypotheses previously put forth by Lamarck, Demainlet and others. Lamarck believed in the transmutation of species by the operation of some "*impulse from within*," as modified by the influence of external circumstances upon the organization. All along through Mr. Darwin's works, for the explanation of many crucial phenomena not otherwise to be accounted for, we are referred to some *unknown cause*, residing in the *nature and constitution of the organism*; while natural selection presents the operation of those "*external circumstances*," in the "*struggle for existence*," which determine the "*survival of the fittest*."

Now, Mr. Mivart, as well as Mr. Darwin and Mr. Wallace, is an "Evolutionist." His only quarrel with

Mr. Darwin's theory is upon its claim to be an adequate and comprehensive account of evolution. He is not willing to regard all the operations of the universe as purely unmoral and unintelligent. Instead of talking about "unknown" causes or forces, and stopping there, he is for establishing a theory of evolution which shall be consistent with the natural and intuitive ideas of *Theism*; and he believes the facts of Nature point clearly in this direction: a belief in which we may safely agree with him, unless we are to distrust that logical apprehension of the relation of cause and effect which everywhere characterizes human nature and human intellect among the beings of this world. He puts forth a theory of evolution, which he calls "Derivative Creation," and which is "simply the Divine action by and through natural laws," as distinguished from the original "primary or absolute creation" of the elements of the world. Of this theory he says:

This view of evolution harmonizes well with theistic conceptions; not of course, that this harmony is brought forward as an argument in its favor generally, but it will have weight with those who are convinced that theism reposes upon solid grounds of reason as the rational view of the universe. To such, it may be observed that, thus conceived, the Divine action has that slight amount of resemblance to and that wide amount of divergence from, what human action would be, which might be expected *a priori*—might be expected, that is, from a being whose nature and aims are utterly beyond our power to imagine, however faintly, but whose truth and goodness are the fountain and source of our own conceptions of such qualities. (*Genesis of Species*, p. 254.)

He believes in an "eternal law" presiding over the actions of the entire organic world, and that this "conception of an internal innate force will ever remain necessary however much its subordinate processes and actions may become explicable;" moreover, that this internal force "is determined to action by the stimulus

of external conditions ; " but that " these external influences equally with the internal ones are the results of one harmonious action underlying the whole of Nature, organic and inorganic, cosmical, physical, chemical, terrestrial, vital and social."

If any one should ask, how this differs from Mr. Darwin's view, Prof. Owen, in his work on the " Anatomy of Vertebrates," might supply the answer :

" Derivation " sees among the effects of the innate tendency to change irrespective of altered circumstances, a manifestation of creative power in the variety and beauty of the results ; and, in the ultimate forth-coming of a being susceptible of appreciating such beauty, evidence of the pre-ordaining of such relation of power to the appreciation. " Natural selection " acknowledges that if ornament or beauty, in itself, should be a purpose in creation, it would be absolutely fatal to it as an hypothesis. " Natural Selection " sees grandeur in the view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one. " Derivation " sees therein a narrow invocation of a special miracle and an unworthy limitation of creative power, the grandeur of which is manifested daily, hourly, in calling into life many forms, by conversion of physical and chemical into vital modes of force, under as many diversified conditions of the requisite elements to be so combined. (*Cited, Genesis of Species*, p. 255.)

Every one knows who has read the *Origin of Species*, that the " dogma of separate creations " is a sort of *bête noir* of Mr. Darwin's : and in one place he admits that the desire to overthrow that dogma had led him too far. (*Descent of Man*, Vol. I., p. 146.) Certain it is that Mr. Darwin treats the opponents of his exclusive theory of evolution by natural selection as advocates of the dogma of absolute separate creations. He says :

These authors seem no more startled at a miraculous act of creation than at an ordinary birth. But do they really believe that at innumerable periods in the earth's history certain elemental atoms have been commanded suddenly to flash into living tissues ? Do they believe that at each supposed act of creation one individual or many were produced ? etc. (*Origin*, p. 431.)

But derivative creation, in virtue of some innate law, or inherent tendency, does not imply any such thing as this. Even Dr. Asa Gray, in his remarks on Darwin in the *Atlantic Monthly*, twelve years ago, pointed out this fact, when he said :

Agreeing that plants and animals were produced by omnipotent fiat, does not exclude the idea of natural order and what we call *secondary causes*. The record of the fiat, "Let the earth bring forth grass, the herb yielding seed,"—"let the earth bring forth the living creature after his kind"—seems even to imply them.

Of course, we are at liberty to suspend our judgment as to the question whether any general system of evolution at all has been sufficiently made out from the facts and phenomena thus far observed. But there can be no mistaking the fact that evolution by derivative creations is a very different thing from evolution by natural selection: that the former is consistent with theism, while the latter is not. Mr. Darwin himself, we apprehend, recognizes this state of the case. In his work on "Animals and Plants under Domestication," he enters into a long metaphysical argument to prove that if an omniscient creator could have intentionally ordered the shape of fragments of rock for the builder, or the variations in animals for the breeder, then "the plasticity of organization, which leads to many *injurious* deviations of structure, as well as that *redundant* power of reproduction which inevitably leads to a struggle for existence, and as a consequence to the natural selection and survival of the fittest, *must appear to us superfluous laws of nature.*" He says also :

If we give up the principle in one case—if we do not admit that the variations of the primeval dog were intentionally guided in order that the greyhound, for instance, that perfect image of symmetry and vigor, might be formed—no shadow of reason can be assigned for the belief that the variations, alike in nature, and the result of the same general laws, which have been the ground work

through natural selection of the formation of the most perfectly adapted animals in the world, man included, were intentionally and specially guided. However much we may wish it, we can hardly follow Prof. Asa Gray in his belief that "variation has been led along certain beneficial lines like a stream along definite and useful lines of irrigation." (*Cited in Genesis of Species*, p. 272.)

This is certainly conclusive as to Mr. Darwin's views of theism and teleology both. It is impossible metaphysically to separate the theory of evolution by natural selection from the old atheistic Lucretian doctrine of *chance*, which Cicero, even while he listened to it, and as his works show, thoroughly understood it, yet regarded with inexpressible abhorrence. Prof. Huxley himself, who regards teleology as unscientific, undoubtedly gives the correct construction of Darwinism in regard to this subject. He says:

If we apprehend the spirit of the "Origin of Species" rightly, nothing can be more entirely and absolutely opposed to Teleology, as it is commonly understood, than the Darwinian theory. According to teleology, each organism is like a rifle bullet fired straight at a mark; according to Darwin, organisms are like grape shot of which one hits something and the rest fall wide. For the teleologist an organism exists because it was made for the conditions in which it is found: for the Darwinian an organism exists because, out of the many of its kind, it is the only one which has been able to persist in the conditions in which it is found. Far from imagining that cats exist *in order* to catch mice well, Darwinism supposes that cats exist *because* they catch mice well—mousing being not the end, but the condition of their existence," &c. (*Lay "Sermons,"* p. 303.)

We do not propose here to follow Mr. Mivart in his masterly answer to Mr. Darwin's objections against the truth of any such supposition as that of the special guidance by an omniscient Creator in the various phenomena of organic beings; but we agree with him that the belief in such intelligent agency—in a God and Creator, does not repose upon physical phenomena, but

upon the “primary intuitions” of man. And as to “laws of nature appearing superfluous” under such a belief, a good naturalist, who is familiar with so many yet unexplained phenomena in the world, ought to be the last man to deny that such “appearance” may be only the effect of human ignorance. As to Mr. Darwin’s question whether it can be supposed that an omniscient creator ordained sundry details, such as “variation” for certain limited purposes as they appear to us, Mr. Mivart makes the following profound reply:

The theist, though properly attributing to God what, for want of a better term, he calls “purpose” and “design,” yet affirms that the limitations of human purposes and motives are by no means applicable to the Divine purposes. Out of many, say a thousand million reasons for the institution of the laws of the physical universe, some few are to a certain extent conceivable by us; and among these, the benefits, material and moral, accruing from them to men, and to each individual man in every circumstance of his life, play a certain, perhaps a very subordinate part. As Baden Powell observes, “How can we undertake to affirm, amid all the possibilities of things of which we confessedly know so little, that a thousand ends and purposes may not be answered, because we can trace none, or even imagine none, which seem to our short-sighted faculties to be answered in these particular arrangements?” (*Genesis of Species*, p. 276.)

It has already been seen that Mr. Wallace, as well as Mr. Mivart, has parted company with Mr. Darwin, in that he too believes in a system of evolution which is under the operation and guidance of a ruling Intelligence.

This is the head and front of their offending in the eyes of Prof. Huxley, and the occasion of the sarcastic passage we have already quoted.

Mr. Mivart believes that this theory of derivative creations covers and harmonizes all the facts that have heretofore been relied upon to sustain severally the teleological, typical and transmutationist conceptions of

the organic world, and he is naturally solicitous to prove, therefore, that there is nothing in the doctrine of evolution *per se*, to conflict with religion. This it is, which more than anything else, appears to arouse the ire of Prof. Huxley in the paper now under our notice. We declare that the tone and manner of Prof. Huxley in this paper, remind us irresistibly of a passage in Mr. Mivart's chapter on "Theology and Evolution," which, though it gives no evidence of any intended personal application, seems too well to fit some of these strong-worded defenders of Darwinianism :

Some individuals within this latter class, (*i. e.* of those who are "hostile to religion,") may not believe in the existence of God, but may yet abstain from publicly avowing this absence of belief, contenting themselves with denials of "creation" and "design," though these denials are really consequences of their attitude of mind respecting the most important and fundamental of all beliefs. (*Genesis of Species*, p. 260.)

If Prof. Huxley could have supposed that this passage was levelled directly at himself, he could hardly have been thereby provoked to show greater unfairness and discourtesy than he has in this reply to Mr. Darwin's critics. His direct appeal is to the *odium theologicum*. Referring to the assertion of Mr. Mivart that there is no necessary opposition between evolution and religion, he begins with the *brusque* demand :

But then what do they mean by this last much abused term ? On this point the Quarterly Reviewer is silent. Mr. Mivart, on the contrary, is perfectly explicit, and the whole tenor of his remarks leaves no doubt that by religion he means theology ; and by theology that particular variety of the great *Proteus*, which is expounded by the doctors of the Roman Catholic Church, and held by the members of that religious community, to be the sole form of absolute truth and of saving faith. (Page 8.)

He also professes himself greatly astonished to hear that any Christian writers of former times had shown

anything like a doctrine of "derivative creation" or "evolution"; and sets himself to analyze the evidence of any such fact, with the object, as he sarcastically declares, of being able "to put some Protestant Bibliolater to shame, by the bright example of Catholic freedom from the *trammels of verbal inspiration.*" To show that evolution is not inconsistent with theology, Mr. Mivart had quoted such ancient and mediæval writers as St. Augustine, Thomas Aquinas, and the more modern Suarez; and had expressly declared his opinion that "the prevalence of this theory (of evolution) need alarm no one, for it is without any doubt, perfectly consistent with the strictest and most orthodox *Christian* theology." Prof. Huxley, in citing this passage, adds a footnote, to the effect "that Mr. Mivart employs the term "Christian" as if it were the equivalent of Catholic," —a statement the fairness and decency of which we leave all who have read Mr. Mivart's "Genesis of Species" to judge.

As lovers of science we must protest against such a tone and method of treatment as are involved in these statements of Prof. Huxley, as altogether unworthy of his cause, unless, indeed, his cause be that of atheism: and, in fact, we are not disposed to be so charitable toward the Darwinian form of evolution in respect to its bearing on religion, as Mr. Mivart is himself, while he does not accept it. Prof. Huxley seems to object to confounding "religion" with "theology"; but if *theology* begins with recognizing the existence and government of a God, we must decline to accept from Prof. Huxley any *religion* that denies these two first principles of theology. His animus toward what he calls the "great Proteus" is not to be mistaken: and it does appear that he would not abstain even from the low artifice of seeking the applause of "Protestant Bibliolaters,"

by an assault on "that particular variety" of it which Mr. Mivart professes to hold as a *Roman Catholic*,—a fact we should have never discovered from Mr. Mivart's book, since he refers only to those truths or doctrines which are believed by all Christians alike. And to class St. Augustine, St. Basil and Thomas Aquinas with any modern party or school on the question of church organization, is very much as if one sought to get up a special claim to Shakspeare, or a prejudice against him either, on the ground that he happened to belong to the national church of the country in which he was born!

But we must ask Prof. Huxley, *cui bono?* To be sure, the question has but little to do with physical science itself, but if Mr. Mivart desires to assure the outside world which has no time for judging the merits of these matters, that there is no insuperable conflict between evolution (even Prof. Huxley's form of it) and the Christian religion, what is there in such an amiable wish to exasperate Prof. Huxley's sense of truth and propriety? Does the reference to the metaphysical speculations (not doctrines) of early Christian writers as to the cosmogony, seem to interfere with the boast that this new theory of evolution is "a new *creative thought*" of Mr. Darwin's own brain? If so, Prof. Huxley is too easily alarmed for the laurels of the "mutual admiration society" of modern English scientists; though he ought not certainly to be jealous of *any* theory of evolution which, like that of Mr. Mivart's at least, promises to commend itself to those who believe that there are more things in heaven and earth than are dreamed of in the philosophy of Mr. Darwin and Prof. Huxley.

It might indeed be said further, that Prof. Huxley more than suggests an ulterior object, of which he hardly leaves us in doubt, from the language he uses in

regard to the Christian Scriptures. He at least, is no “Bibliolater.” But before he sets up as theologian, he ought to have told us what he means by the “trammels of *verbal* inspiration.” He speaks of the “preposterous fable respecting the fabrication of woman,” and says the IVth commandment, read in churches, states a *falsity* in regard to the creation, and not only that, but what Christians “are bound to know to be falsities,” or if they use the words in some non-natural sense [*i. e.*, the word *day* for a long *period*,] they fall below the moral standard of the much abused Jesuit.” And at the close of his examination of Mr. Mivart’s “authorities,” (in which all he makes out is that Suarez did not, after all, agree with St. Augustine, or follow him in full,) he sums up by saying that no man can be both a true son of the Church and a loyal soldier of science;” to which he adds such expressions as these, “that a hell of honest men will, to him, be more endurable than a paradise full of angelic shams”: and whereas Mr. Mivart asserts that without a belief in a personal God, there is no religion worthy of the name,” he rejoins, “that the worship of a personal God, *who, on Mr. Mivart’s hypothesis, must have used language studiously calculated to deceive His creatures and worshippers is no religion worthy of the name.*” Let it be observed that he applies this semi blasphemous language to an honest attempt to interpret the Scriptures in accordance with *any* theory of evolution, and is not willing to allow a Christian to understand by the “six days of creation” anything but the usual periods of twenty-four hours each.

Now all this is senseless objurgation, and utterly unworthy of science, though it *is* worthy of atheism. There is a painful air of petulance and juvenility about it,—of a zeal without ordinary discretion. There have

been theologians who insist upon the literal interpretation of the vision of creation in Genesis: (for the Bible begins with an Apocalypse as well as ends with one—both equally difficult to interpret, as both are beyond the reach of human observation, past or present,) while other theologians have reconciled Genesis and geology after the manner of Hugh Miller. Who gave Prof. Huxley the right to say, as his whole tone implies, that the Bible *can not be*, and *shall not* be at one with the actual demonstrations, we do not say the unproved speculations, of science? Will Prof. Huxley pretend to enlighten theologians by telling them that they must not see any symbolic language in the book of Revelation? He might as well do so as to presume to dictate their use of the word *day* in the account of the creation. Although his examination of Suarez, (he leaves alone the other authorities cited by Mr. Mivart,) exhibits his learning and cleverness pretty well, even if no other object were accomplished, yet his handling of this whole subject of theology, convinces us that even in "science" the old rule ought to hold good, *Ne sutor ultra crepidam.*

It was certainly a most senseless and unscientific procedure to take up a dispute with Mr. Mivart as to whether the thought of evolution had ever entered the mind of Christian writers of former ages. What more natural than that their speculations on cosmogony should have bordered on this as well as other theories, especially, when as we have shown before, something like the same thoughts had occurred to the greatest thinkers of Pagan antiquity before them? It is utterly aside from any practical purpose to review Prof. Huxley's examination of Suarez, for what does it signify to show that Suarez is disposed to be more *literal* on the question of creation than Augustine? And yet accord-

ing to his own showing, Suarez, like Mr. Mivart, "requires no divine assistance till he comes to man's soul," which he regards as the "substantial form" of man, proceeding in regard to the endless mutations of material bodies, upon the ancient principle "*ex nihilo nil fit*," which, after all, is only a doctrine of evolution. Whether Suarez himself actually applied the principle of the evolution of substantial forms to animals and plants, it is manifest that he held the principle. The passages which Mr. Mivart does quote from Augustine, Cornelius à Lapide, and Aquinas are directly to the point and prove what he designed to prove by them, as any one may see who will consult them in his chapter on "Theology and Evolution"—a chapter, which in our view, the most eminent philosopher of the age might be proud to have written. And if from any special interest, personal or scientific, Prof. Huxley feels bound to oppose the reconciliation of science and religion, he ought to be warned of what is portentously true, that the practical consequences of a mistake on his part to society and the world are a thousand fold more tremendous than any error in Mr. Mivart's views. The following words of the latter ought to be pondered by every student of science:

The Christian system is one which puts on the strain, as it were, *every* faculty of man's nature, and the intellect is not, (any more than we should *a priori* expect it to be,) exempted from taking part in the probationary trial. A *moral* element enters into the acceptance of that system. And so with natural religion—with those ideas of the supernatural, viz., God, creation, and morality, which are anterior to revelation and repose upon reason. Here, again, it evidently has not been the intention of the Creator to make the evidence of His existence so plain that its non-recognition would be the mark of intellectual incapacity. Conviction, as to theism, is not forced upon men as is the conviction of the existence of the sun at noonday. A moral element also enters here, and the

analogy there is in this respect between Christianity and theism speaks eloquently of their primary derivation from one common source. Thus we might expect that it would be a vain task to seek anywhere in nature for evidence of Divine action, such that no one could sanely deny it. God will not allow Himself to be caught at the bottom of any man's crucible, or yield Himself to the experiments of gross-minded and irreverent inquirers. The natural, like the supernatural revelation, appeals to the *whole* of man's mental nature and not to the reason alone. None, therefore, need feel disappointed that evidence of the direct action of the First Cause in merely natural phenomena ever eludes our grasp: for assuredly these same phenomena will ever remain fundamentally inexplicable by physical science alone. (*Genesis of Species*, p. 287.)

Professor Huxley lays down the principle that reason and morality can not have "two weights and two measures," and adds that the antagonism between theology and science is due to the fact that men of science can not "allow that the belief in a proposition, because *authority* tells you it is true, or because you wish to believe it—which is a high crime and misdemeanor when the subject-matter of reason is of one kind, becomes under the *alias* of 'faith' the greatest of all virtues, when the subject-matter of reason is of another kind." Now as to "two weights and measures," can Prof. Huxley deny that mathematical evidence, which leaves no place for will or choice or judgment, is a different thing from moral evidence, which calls into play the elements of spontaneity and responsibility in man's nature? It is impossible that the affairs of the world, the administration of law, justice, and government, should proceed only upon the same "weights and measures," without which we deny any real advance to physical science. In the conduct of life, humanity could not wait for indisputable conclusions of pure science: and if Prof. Huxley denies that probable or moral evidence supplies adequate motives for human conduct, he ought never to trust his life to the good faith of his

fellow men, as he does every time he sits down to his dinner, but he should carry the processes of his laboratory with him wherever he goes. All subjects do not admit the application of the same "weights and measures." It is not merely in physical science that questions occur, "the conditions of which," as Prof. Huxley himself remarked in a former defence of Mr. Darwin, "are not only exceedingly complex, but so far as the great majority of them are concerned, are necessarily beyond our cognizance." And a man who endorses Mr. Mill's declaration, "that there are multitudes of scientific inquiries in which the method of pure induction helps the investigator but a very little way," ought not to complain of or sneer at "two weights and measures" for science and theology, under the name of reason and "faith." As it is, Mr. Darwin's own books give the most conspicuous illustration of these two "weights and measures" indicated by Mr. Mill.

And as to the "Baal of *authority*, with all the good things his worshippers are promised in this world and the next," against which Prof. Huxley seems to cherish some groundless resentment, as if it really were opposed to the progress of science, we suppose there must be some "authority" somewhere, so long as all men have not arrived at the knowledge of all truth. Even "science" must in the nature of things, come to the vast majority of mankind on "authority"—say the authority of Prof. Huxley and his illustrious compeers. Whether the world would have ever got on without the conception of some higher "authority" than that of the "social compact" or of human laws, is a question in which the interests of civilization itself are bound up. Does Prof. Huxley believe that the civil penalties against perjury have had or have now in society any effect at all comparable to that of the *religious* sanction of an oath?

And yet respect to the obligation of an oath, is that upon which the most secular forms of government are obliged to rely, to make government itself practicable.

The question of “authority,” however, resolves itself at last into the question whether there is a God, and whether it is morally probable and historically true, that a revelation of Him and His will has been made to the human race. Under atheism, of course there is no “authority,” and no law but the chances of Natural Selection, by which all *Right* is but the *Might* of the stronger.

But it is time to have got quit of this “theological” discussion which Prof. Huxley bestows so much attention upon, as if it were a matter of vital importance to show that Christian writers of former times had *not* dreamed of evolution as a possible discovery of science, or that such a theory is reconcilable with Christianity as it has come down to us. For our part, we do not admire his taste, or his apparent object in so far travelling out of the legitimate province which a scientific advocate of any theory of evolution is strictly called to fulfil.

In coming to the psychological criticisms on Darwin’s theory, Prof. Huxley falls foul of the *London Quarterly’s* analysis of the intellectual powers,* under the two-fold classification of Presentative, or instinctive faculties, and Representative, or reflective faculties. He finds fault with it because it omits to give an account of the sensibilities and the will, when it simply professes to be a formula of the intellectual faculties. He objects to “drawing a hard and fast line” between

* This, in a previous article of this series, was by a typographical error, credited to a number of the *Edinburgh* of the same date, (July, 1871.)

thought and sensation, and says "that faint reproduction of a sensation which we call the memory of it, is properly termed a thought." This is a mere playing upon words, by which any kind of impression upon the mind,—perhaps even the mere reflex action of the nervous system, like an infant's seeking its mother's breast, might be put on a par with the elaborate reasoning processes by which Prof. Huxley would establish some proposition of natural science. Sensation certainly is not thought, however it supplies objects of thought to a mind previously capable of thinking in the proper sense of that word, as distinguished from mere feeling. A man may allow himself to be guided by mere sensation, and the association or memory of sensations, and thus assimilate himself to the brute: but that he *possesses* faculties different in kind as well as degree from those of the brutes, is what every system that deserves the name of a philosophy among men has always recognized. We are not concerned to adopt or reject the analysis of the *Quarterly Reviewer* in all its details, but the general outline of his classification into presentative or "indeliberate" faculties on the one hand, and the reflective or rational faculties on the other, is by no means new or peculiar. Sir William Hamilton makes the two highest elements of the human mind to be, 1st, the *Discursive* or elaborative faculty, which performs the work of generalization or comparison, and which corresponds to the *Διάροτα* of the Greek, or *thought*, properly so called; and 2d, the *Regulative* faculty or reason, which corresponds to the Greek *Νόης*, intellect or common sense. Under this last head comes what is called by others Intuition or Insight, which is not so much a *faculty* of reason, as a *light* without which no exercise of reason is possible, or as Sir William Hamilton calls it, "the complement of the fundamental principles or laws of

thought"—a complement of *à priori* native cognitions, under which our knowledge *à posteriori* is possible. It is these elements which have nothing, so far as we can discover, corresponding to them in the brute creation. And if the *Quarterly Reviewer* is correct in showing this difference *in kind* as regards powers of intellect, *à fortiori* the argument will dispose of the question of moral obligations, emotions, sense of right and wrong, of the supernatural, &c.

Two things ought to be remembered in this controversy: 1st, that the mental operations of brutes is not a subject that can come within the sphere of human consciousness at all, and therefore can not be spoken of with the same certainty as that with which we analyze the phenomena of the human mind; and, 2d, that the *onus probandi* lies with those who assert that our mental faculties are but the developed instincts of ants and bees. We can not be called upon to *prove* a negative hypothesis: but to go at the subject of psychology from the side of natural history alone seems about as unlikely a way to prove the Darwinian account of the origin of intellect as it would be to try to explain the mysteries of palaeontology by the aid of inorganic chemistry alone. Even Mr. Darwin admits this difference between man and the lower animals, that man has to *learn* his work by practice, even such things as the lower animals do from the start instinctively and without conscious intelligence; but he assumes that the development *into* conscious intelligence is the result of "variations" arising from "unknown causes acting on the cerebral organization." We have no objection to the confession of ignorance implied in resorting to the expression, "unknown causes," but of the positive part of this statement there is not a vestige of proof.

Prof. Huxley gets up a comparison between the pro-

cesses that take place respectively in the minds of a gamekeeper and a hound in leash when a hare crosses the field of vision, and attempts to show that they are identical. He says: "In the dog there can be no doubt that the nervous matter which lies between the retina and the muscles undergoes a series of changes, precisely analogous to those which in the man, give rise to sensation, a train of thought and volition." He insists that if the processes in the man are accompanied by consciousness, those in the dog must be so too. He believes the only alternative to this is, with Descartes, to consider all animals unconscious machines. But is this the only alternative? If Prof. Huxley's notion of an identical *neurosis* and *psychosis* in dog and man is correct, then there is no such thing as *instinct*, and there can be no such thing as automatic actions, properly speaking. We would ask Prof. Huxley whether, supposing neither the dog nor man had ever seen a hare before, the *neurosis* in the two being the same, the *psychosis* might not be entirely different? It is a fact not to be got over in this way, that these actions of animals are performed in the same way from the first, (it would be absurd to maintain that animal *training* by mere association is the same as *education* of the intellect in man,) and that they are performed without regard to those considerations of purpose, consequences, time, place and circumstance which pass through the mind of man in connection with an action. Why does a beaver try to build its dam when confined in a dry courtyard? The phenomenon is perfectly familiar to us of various animals endeavoring to perform instinctive actions in circumstances of ludicrous impossibility. Instinct need not be a mere matter of mechanism, but it certainly must be an innate law of action working by inherited impulse, and not a matter of acquisition or educability at

all. As such it differs essentially from the intelligence of man. If instinct be only a form of intelligence, it would be in many cases far superior, *quoad* intelligence, to the intelligence of man. In fact the perfection of animal instinct, as compared with the tentative efforts of human intelligence *toward an ideal*, presents very much such a contrast as a bee's string does to a cambric needle under the microscope. There is certainly no evidence of self-consciousness in brutes, or the power of reflecting upon and analyzing their sensations, what they are and why they are, of drawing general inferences and predicating universal abstract propositions. They have consciousness, so far as sense perception implies consciousness, but it is only the consciousness of sensation. As Prof. Haven remarks, "the brute feels and acts; man feels, *thinks*, and acts." And feeling alone no more involves or requires intelligence, or the operations of intellect, than instinct does. And as to memory, it can not be proved that brutes *retain* images and sensations, but only that they *recognize* them when re-presented, which is a different thing. How can Prof. Huxley know that they can of themselves recall things that are absent, or sensations that are past? One may see how far short he falls of the *differentia* of real intellectual operation by his remark:

If a machine produces the *effects* of reason, I see no more ground for denying to it the reasoning power, because it is unconscious, than I see for refusing to Mr. Babbage's engine the title of a *calculating* machine, on the same grounds. (Page 34.)

This is mere sophistic, rhetorical *accommodation* of words. He would doubtless say also that the idiot boy who displayed a marvelous power of summing up numbers, ought to be called a mathematician, though he could not tell how he did it. But the fact is, the idea of an *unconscious* intelligent agent is positively un-

thinkable; and Mr. Darwin's attempt to reduce the spontaneous activities of thinking, reasoning beings to the category of blind physical law or impulse is but an attempt to eliminate all intelligence, according to any possible conception of it, out of the universe altogether.

As is well known from his views of the "Physical Basis of Life," Prof. Huxley believes that "our thoughts are the expression of molecular changes in that matter of life which is the source of our other vital phenomena." In answer to the criticisms of Mr. Wallace and Prof. Tyndal upon this view, referred to in one of our previous articles, he now says that though there is evidence of some correlation between mechanical motion and consciousness, he does not pretend that the nature of that correlation is known or can be conceived, and then adds:

Mr. Wallace presumably believes in that correlation of phenomena which we call cause and effect as firmly as I do. But if he has ever been able to form the faintest notion how a cause gives rise to its effect, all I can say is, that I envy him. . . . In ultimate analysis, everything is incomprehensible, and the whole object of science is simply to reduce the fundamental incomprehensibilities to the smallest possible number. (Page 38.)

This number can never become very small then, for what can have a wider range than "that correlation of phenomena which we call cause and effect"? This is a good deal like giving up the question. Suppose it shown that every state of consciousness—every thought and feeling of the mind—is accompanied uniformly by certain molecular changes in the nervous matter, by what logical right does he call the one the "expression" of the other, or compare their relation to the process which goes on in an electric battery? As Prof. Tyndal says, anticipating this sleight of rhetoric, "the cases differ in this, that the passage from the current to the

needle, if not demonstrable, is thinkable, and that we entertain no doubt as to the final mechanical solution of the problem: but the passage from the physics of the brain to the corresponding facts of consciousness is unthinkable." Prof. Huxley ignores this distinction altogether, and merely repeats the old materialist fancy so effectually exploded by Prof. Tyndal. "The utmost he can affirm," to use Prof. Tyndal's language again, "is the *association* of two classes of phenomena of whose real bond of union he is in absolute ignorance."

But, after all, even on the spiritual theory of the existence of the soul as a separate entity, can Prof. Huxley show that there should not have been precisely this association of two classes of phenomena, physical and psychological: if the reasonable soul was joined to a material body for a habitation in this world, and for normal relations with it? Though these speculations must ever carry us out of our depth, it would seem that this correlation of physical processes to consciousness is what *ought to have been*, under this theory, and in no manner militates against the essential existence of the human soul itself.

Nothing can show the superficial character of Prof. Huxley's metaphysics better than the following passage, in which the distinctive nature of the *reason* of man, as distinguishing him from the lower animals, is treated merely with a *bon mot*:

If man is not to be considered a reasoning being, unless he asks what his sensations and perceptions are and why they are, what is a Hottentot, an Australian black fellow, or what the "swinked hedger" of an ordinary agricultural district? Nay, what becomes of an average country squire or parson? How many of these worthy persons who, as their wont is, read the *Quarterly Review*, would do other than stand agape, if you asked him whether he had ever reflected what his sensations and perceptions are, and why they are?

The gift of language alone, inconceivable apart from reason, puts the Hottentot, as a reasoning being, at an infinite remove from the highest animal, not as a matter of degree or distance merely, but of kind and nature. Prof. Huxley's logic would be, that a parrot has the rudimentary gift of language, because it can articulate; just as the *calculating* machine "produces the *effects* of reason." But can not a child see that language implies the power, even in the Australian black fellow, of reflecting upon his perceptions, comparing them, conveying them to others, judging of them, and acting upon them, as no voiceless brute ever could do? These lowest specimens of humanity *do* reflect upon their sensations, and do seek for *causes* as no animal does. Besides, they have all the faculties we have, whether they use them or not, and even if they have no use for them—a fact which completely overthrows the whole theory of natural selection as applied to man. The "swinked hedger" can be developed into a Gladstone, and the Hottentot into a Bishop of Sierra Leone. If there is no difference in kind between instinct and intelligence, why in all these ages, nay, why in the life of a single ape, could there not be the development of some rudiments of language in the highest of the animals below man? It certainly is not because of undeveloped principles in them—it is because the essential principle is *not there to be developed*: that is, the Thought and Reasoning faculty of man. Prof. Huxley's gird at the old conservative *Quarterly* and its readers, ought in fairness to have been distributed; for he must have seen in the *Edinburgh*, of the same date, an article which in some respects is stronger than that in the *Quarterly*. It declares that "to interpret the mental processes of lower animals by our own standard, is to be guilty of an anthropomorphism quite as great as that which the mate-

rialists lay to the account of theologians;" that "if our intellect and moral sense be mere developments of certain elements in the lower animals by natural selection, man is merely a superior sort of brute, the great Ruler of the world a mere shadow of ourselves projected by our imagination, and our morality a mere instinct of the same order as that which rules the actions of the worker-bee;" and that though Mr. Darwin states that his argument does not touch the question of the existence of a God, yet "it completely destroys the objective value of any idea which we can form of Him, and this practically amounts to the same thing." Perhaps it is because Prof. Huxley substantially and *con amore* agrees with this "theological" aspect of the question, that he does not care to controvert it. If we conceive that the brute creation has no conception of any relation to God, that to it God is an unknown and unknowable thing, it is precisely that condition to which materialism proposes to reduce the human mind. The writer in the *Edinburgh* discusses Mr. Darwin's theory of language and of sexual selection rather more incisively than the *Quarterly*: and he sums up his consideration of the non-physical characters of humanity with the remark:

To measure man's superiority over the brute by his bodily frame is the only method by which a naturalist can construct his system: but to proceed to say that there is a corresponding identity of mental character between man and brute is to refuse to acknowledge facts in psychology which are as well ascertained as any of those in natural history. Till Mr. Darwin can show that the higher faculties of the human mind, such as the power of abstract thought and of forming general ideas, are merely developed from rudiments in the brutes by natural selection, his conclusion that the human mind is the same in kind with that in the brutes, is a mere assertion without proof. To discuss the problem with these important factors left out, is to play Hamlet with the character of Hamlet left out. (*Ed. Rev.*, July, 1871.)

This reminds us that Prof. Huxley has gone further and faster than Mr. Darwin himself. The above paragraph refers to the fact that Mr. Darwin declines to discuss metaphysically the higher intellectual faculties of man, such as self-consciousness, abstraction and the comprehension of universals, though he believes them the result of a high development of mental powers, leaving us to get what definite idea we may out of this vague language; and the reason he gives for not discussing them is that "hardly two authors agree in their definitions." Mr. Darwin did not consider that this omission was fatal to the value of his argument, but Prof. Huxley sees the necessity of reconciling the novel hypothesis with the accepted views and ascertained facts of psychology. And how, after all, has he helped his friend in this matter? By dragging him down to the sorry refuge of the baldest materialism. By assuming that all "*psychosis*" is but the result of correlated "*neurosis*," that mental action is only molecular change, even as motion and heat are convertible, or as the chemistry of an electric battery gives rise to the phenomena of light and sensation in the retina of the eye. Ought we not to be thankful to him for his forbearance in the following sentence!—"Whether we shall ever be able to express consciousness in *foot-pounds*, or not, is more than I will venture to say." But when driven into a corner and challenged to show or prove the passage or fact of passage from the physical to the non-physical, he defiantly turns upon us with a declaration of the inscrutability of the real relation of cause and effect in general, and of the incomprehensibility of any phenomenon whatever in its ultimate analysis. The question then is, whether, by his new theory, he has not *multiplied* incomprehensibilities instead of diminishing them—whether, in fact, by his own confession his whole sys-

tem of physico-metaphysics is not turned into a mere castle-in-the-air? At any rate, until he can give us something like proof—something at least that does not contradict all previously recognized laws of thought, we shall be content to apply to this subject the dictum of Prof. Tait, before cited,* that “the assertion that not merely life but even volition and consciousness are mere physical manifestations, is an error into which it is not possible for a genuine scientific man to fall, so long at least as he retains his reason.” That Prof. Huxley has now fallen into it, and wilfully ranges himself in the category of those who make that assertion, we think must be evident to his most earnest admirers.†

So far then as regards the intellectual powers of man. If Prof. Huxley and the Darwinian theory fail here, much more must they fail when we come to the still higher department of man’s nature, the moral or spiritual. For intellect is not the best part of man, even though natural science has little nourishment for any

* *Jour.* for October, 1871, Art. No. 1, page 22.

† Since the above was written, we have casually met with the clear and excellent work of Dr. Noah Porter, of Yale College, on “The Human Intellect.” His summing up on this very point is so conclusive that we subjoin it here, in his own words:

The argument of the Materialist stands thus: Certain psychical states or processes require as their condition certain organic bodily affections. Those bodily affections, however, are totally unlike the mental state which they conditionate. In every case in which they do occur they present new objects of apprehension and feeling. By these, and by these only, the soul receives its knowledge of the material world. Certain other mental states, far more numerous and far more important, are attended by no affections of the body whatever. Which then is more philosophical, to assume that such organic changes do occur when we can not trace their presence, nor any appearance of the organ in which they might be traced, or to which they might be referred, because, forsooth, they do occur when we can trace them and can give the reason for their occurrence; and then, with the aid of this unauthorized assumption, to infer that the soul and body are one organism;—or to disbelieve that such bodily changes do occur as the condition of mental activity, when we have no evidence from observation and no presumption from analogy?

other. Our intellectual superiority is a glorious thing, but it is compatible with the life of a brute. Taking this alone, *a priori* there might be some plausibility in developing it out of the accurate instincts of lower animals, so independent is it of the will and other moral qualities of man. It might be even a splendid intellect that should seek to reduce man to a mere category of the brute creation. The education of intellect alone nowhere touches what we call the *heart*, or moral nature of man, which supplies all his motive power, which carries the *whole* man with it, intellect and all, and "out of which are the issues of life."

Prof. Huxley objects to the elementary distinction between formal and material morality, dwelt upon by Mr. Mivart, and says that "the adoption of any such principle is the denial of all moral value to sympathy and affection." That is, we suppose, to maintain that an act to be *moral*, must proceed from a *conscious will*, would cut him off from attaching the moral quality to the affection of a bird for its young, or of a dog for his master. This is the gulf to be bridged, and Mr. Mivart simply breaks down the bridge. And Prof. Huxley we find now actually advocating the absurdity of unconscious moral acts! This goes far beyond the *opus operatum* theory of virtue or grace supposed to be held by that school of theologians against which Prof. Huxley in the outset sought to excite prejudice. Mr. Mivart is the one that is found to vindicate the popular religious and ethical axiom, that there is no *moral* quality in any act where there is no conscious will directed toward the fulfilment of duty. Prof. Huxley says that, "if mankind ever generally accept and act upon Mr. Mivart's axiom, they will simply become a set of most unendurable prigs." This would certainly be disagreeable and inconvenient. But it is quite important to know what

true morality is. What he and Mr. Carlyle seem to describe as unconscious morality, is really nothing more or less than the character of *habitual* goodness. Will Prof. Huxley say that the movement of the fingers of a practised player upon a piano is, in the proper sense of the words, either unconscious, or automatic? A life *trained* to virtue, from the love of virtue, may often show what looks like unconscious moral action: but after all, does not the will act as rapidly and unobservably as either the intellect, or if you please, the reflex action of the nervous system? Unconscious moral action is simply a contradiction in terms. Mr. Mivart said that "there is no trace in brutes of any actions simulating morality which are not explicable by the fear of punishment, by the hope of pleasure, or by personal affection." To this Prof. Huxley replies:

But it may be affirmed, with equal truth, that there is no trace in men of any actions which are not traceable to the same motives (!) If a man does anything, he does it either because he fears to be punished if he does not do it, or because he hopes to obtain pleasure by doing it, or because he gratifies his affections by doing it. (p. 41.)

Here he takes leave, indeed, of his "unconscious morality," but throws us into a maze of bewilderment at the incredibly low standard which he says is sufficient to comprehend all human action. Plato, Kant, Coleridge have all written in vain! Here is the moral outcome of materialism. If Mr. Mivart says that according to the Darwinian theory, "virtue is a mere kind of *retrieving*," Prof. Huxley goes to work to defend and justify the comparison in the same sense that "sculpture is a mere way of stone-cutting." But with all this logomachy it is not possible for Prof. Huxley in this way to reduce the trained habitual character of an educated moral agent to a level with the blind, uncon-

scious instinct of an unreasoning animal: even though he brings to his aid the hereditary transmission of many qualities of character in men. It is part of the very differentia of man to recognize in himself these transmitted qualities, with all his animal appetites and passions, (which no mere animal ever does,) and a part of his moral probation to act accordingly.

To Mr. Wallace's objections to Darwin's "Descent of Man," Prof. Huxley gives briefer and still less satisfactory attention. The crucial point of the large size of brain in the lowest savages as compared with that of the highest apes, he disposes of in a manner bordering on flippancy. He makes out a formidable account of what savages are compelled to know and do, in order to exist in savage life, which contrasts rather strongly with what he had supposed of their brute stolidity in regard to the power of *reflecting* upon their own sensations, in which respect he classed them with the "swinked hedger" and "average country squire or parson." He now says:

In complexity and difficulty I should say that the intellectual labor of a good hunter or warrior considerably exceeds that of an ordinary Englishman. The civil service Examiners are held in great terror by young Englishmen: but even their ferocity never tempted them to require a candidate to possess such a knowledge of a parish as Mr. Wallace justly points out savages may possess of an area a hundred miles, or more, in diameter. (Page 46.)

Now this means, if it means anything, that savages have use for all the brain with which they are endowed, which is an absurd statement. But how happens it, that if, as Prof. Huxley maintains in another place, they do not reflect upon their own perceptions, "what they are and why they are," they have yet the faculties and capacities for doing this, when by his own showing, such faculties should be developed only by the "selective influences" of civilization? This ques-

tion he does not answer. But he goes further and tries to qualify the fact that intellectual faculties are proportioned to the size of brain, by instancing the porpoise, and comparing wolf with dog. Does he mean to say that the brain of the savage being just like that of the civilized man is an exceptional phenomenon in nature: or does he mean to controvert the "correlation" of brain-power to mental superiority? As he does not carry out this argument, it is difficult to see what he does mean. He refers to the competitive or "selective" influences of civilized life "in favor of novelists, artists, and strong intellects of all kinds." To carry this out he ought to be able to show that "favorable variations" like Shakspeare, Goëthe, and Sir Walter Scott are transmitted by heredity!

We quite agree with Prof. Huxley that "the great need of the doctrine of evolution is a theory of variations," and it is our opinion that something definite of that kind is required to give even a decent foundation to the theory of Natural Selection. He now admits that "variation is *not* indefinite, nor does it take place in all directions, *because* it is limited by the general characters of the *type* to which the organism exhibiting the variation belongs." We question whether this admission is not at least dangerous to the whole superstructure of Mr. Darwin's system. For if variation *is* so limited, within a certain cycle around a definite *type*, as the *North British Reviewer* for 1867, (referred to in a former article) contended, then how does variation and selection account for the origin of *new types*, or species? Even this then is not *proved*; while, if it were proved, the labor of Sisyphus must still be undertaken to bring the whole nature of *man* within this theory of Hopeless Materialism.

Ἄντις ἔπειτα πέδονδε κυλίνδετο λᾶας ἀναιδής.—*Od. xi.*, 597.

